

CLAIMS AS AMENDED HEREIN (CLEAN VERSION)

26. (Currently Amended) A targeting construct comprising:

- (a) a first polynucleotide sequence homologous to a first portion of a melanocyte stimulating hormone receptor gene represented by SEQ ID NO:19;
- (b) a second polynucleotide sequence homologous to a second portion of the melanocyte stimulating hormone receptor gene; and
- (c) a selectable marker gene located between the first polynucleotide sequence and the second polynucleotide sequence,

wherein the targeting construct, when introduced into a murine embryonic stem cell, results in a transgenic mouse having a disruption in the melanocyte stimulating hormone receptor gene, wherein the transgenic mouse when homozygous for the disruption in a melanocyte stimulating hormone receptor gene lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene and the transgenic mouse exhibits hypoactivity.

27. (Cancelled)

28. (Currently Amended) A method of producing a targeting construct for a melanocyte stimulating hormone receptor gene represented by SEQ ID NO: 19, the method comprising:

- (a) obtaining a first polynucleotide sequence homologous to a first region of the melanocyte stimulating hormone receptor gene;
- (b) obtaining a second polynucleotide sequence homologous to a second region of the melanocyte stimulating hormone receptor gene;
- (c) providing a vector comprising a selectable marker; and
- (d) inserting the first and second sequences into the vector to produce the targeting construct,

wherein the targeting construct, when introduced into a murine embryonic stem cell, results in a transgenic mouse having a disruption in the melanocyte stimulating hormone receptor

gene, wherein the transgenic mouse when homozygous for the disruption lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene and the transgenic mouse exhibits hypoactivity.

29. (Currently Amended) A method of producing a targeting construct for a melanocyte stimulating hormone receptor gene represented by SEQ ID NO: 19, the method comprising:

- (a) providing a polynucleotide sequence homologous to the melanocyte stimulating hormone receptor gene;
- (b) generating two different fragments of the polynucleotide sequence;
- (c) providing a vector having a gene encoding a selectable marker; and
- (d) inserting the two different fragments into the vector to form the targeting construct, wherein the targeting construct, when introduced into a murine embryonic stem cell, results in a transgenic mouse having a disruption in the melanocyte stimulating hormone receptor gene, wherein the transgenic mouse when homozygous for the disruption lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene and the transgenic mouse exhibits hypoactivity.

30. (Currently Amended) A method of producing a transgenic mouse comprising a homozygous disruption in a melanocyte stimulating hormone receptor gene represented by SEQ ID NO: 19, the method comprising:

- (a) introducing a targeting construct targeting the melanocyte stimulating hormone receptor gene into a murine embryonic stem cell;
- (b) introducing the embryonic stem cell into a blastocyst;
- (c) implanting the resulting blastocyst into a pseudopregnant mouse, wherein the pseudopregnant mouse gives birth to a chimeric mouse; and
- (d) breeding the chimeric mouse to produce the transgenic mouse comprising a disruption in the melanocyte stimulating hormone receptor gene, wherein the transgenic mouse when homozygous for the disruption lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene

and the transgenic mouse exhibits hypoactivity.

31. (Cancelled)

32. (Currently Amended) A transgenic mouse comprising a disruption in a melanocyte stimulating hormone receptor gene represented by SEQ ID NO: 19, wherein where the disruption is homozygous the transgenic mouse lacks production of functional protein encoded by the melanocyte stimulating hormone receptor gene and the transgenic mouse exhibits hypoactivity.

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33. (Previously Added) A cell or tissue isolated from the transgenic mouse of claim 32.

34. (Cancelled)

35. (Currently Amended) A murine embryonic stem cell transformed with the targeting construct of claim 26.